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AUTHOR Tauss, Vita C.; Feigelson, Alan
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ABSTRACT

An attempt was made to determine differences in reading achievement gains and student attitudes towards school between groups of third grade children enrolled in either modified open or traditional classrooms in the same school. The Metropolitan Achievement Test in Reading was used for pre- and posttest comparisons of achievement, and a questionnaire on student attitudes was administered at the end of the school year. Radical differences in the kinds of children assigned to either modified open or traditional classrooms presented serious problems in data analysis. Children had been previously selected for inclusion in a particular classroom setting on the basis of scholarship and ability to adjust (slow learners and non-English speaking children were assigned to traditional classrooms). Therefore, a wide discrepancy was found in pretest reading ability. Also, the total number of children in the modified open classrooms greatly exceeded that of the traditional classrooms. Statistical modifications (described in detail) were made in an effort to cope with these population problems. Results indicated: (1) there were no significant differences in expected reading achievement gains for any group, and (2) there were no significant differences in pupil attitudes. Descriptions of classroom operations observed for both types of teaching approaches provide interesting comparisons. (ED)

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Report on a Comparison of the Reading Achievement and Pupil Attitude Toward School of Third Grade Children Enrolled in Modified Open and Traditional Classrooms in a Public Elementary School

by Vita C. Tauss and Alan Feigelson

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Vita C. Tauss
Assistant Dean of Students
Queensborough Community College
Bayside, New York 11364

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REPORT ON A COMPARISON OF THE READING ACHIEVEMENT AND PUPIL ATTITUDE TOWARD SCHOOL OF THIRD GRADE CHILDREN ENROLLED IN MODIFIED OPEN AND TRADITIONAL CLASSROOMS IN A PUBLIC ELEMENTARY SCHOOL

by Vita Tauss and Alan Feigelson

The school which was selected for the study to be described in the following pages is a public elementary school located in New York City in the borough of Queens. Approximately forty percent of the community which surrounds the school is composed of racial and ethnic groups from all parts of the world; the remaining population is generally middle class white American. The entire third grade of this school was included in the study, of which four classes were operating on the modified open classroom structure and two classes were operating on the traditional classroom structure.

Background of the Study

When the school under study finalized its decision to launch a modified open classroom program, many considerations were involved. The teachers chosen to participate in the program would have to be volunteers, willing to accept and function under the exploratory conditions of an experimental program. The children would have to be selected on the basis of satisfactory to superior scholarship and ability to adjust to a classroom environment which differed markedly from anything in their previous experience. Slower learners and the non-English-speaking children would not be selected in order not to jeopardize their progress in school through unforeseen problems. Four

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groups of children and four volunteer teachers were ultimately selected for the open classroom program.

Part of the study of the children in the open and traditional classrooms in this school included the use of objective sources of information. A questionnaire of pupil attitude toward school was selected for administration to the entire group and an examination of the reading scores of each individual child for the past two years would be made. The former action was taken to obtain a comparison of pupil attitudes toward school of children in the modified open and traditional classrooms. The latter aspect of the investigation would reveal the growth in reading competency of each child in the third grade from his completion of grade two until the latter third of his experience in grade three. This would indicate the cumulative growth of each child in reading achievement over the current school year.

The method for conducting the study involved, in total, the following three parts:

1. An observer made several extended visits to each class of the third grade in the school so that a detailed description of the modified open and the traditional classrooms could be obtained.
2. A questionnaire on pupil attitudes toward school was administered to all third graders in the school.
3. Final second and third grade standardized achievement test scores in reading were examined for all third graders in the school.

Hypothesis of the Study:

1. The group exposed to the modified open classroom would make in-

creased gains in reading achievement as a result of their exposure to the experimental treatment than they would have made had they been exposed to traditional classroom structure.

2. The traditional classroom group would make gains in achievement comparable to the gains made in the previous year of exposure to traditional classroom structure.

3. The group exposed to a year of mod open classroom would have better attitude toward school than a group exposed to traditional classroom structure.

Description of the Modified Open and Traditional Classrooms

Despite minor individual variations in the four third grade modified open classrooms in this school, the basic learning environment was the same. Arriving in their classroom in the morning, an informal large group session was held in which students participated by making individual contributions. Such contributions might include a description of an event of the previous day, a statement of a plan for some classroom activity, an observation, a problem, or any other matter in which the group might share an interest. Following this activity, children were instructed by the teacher to choose their activities for the day and to proceed to carry out their plans. At this point the group broke up into small subgroups. Furniture was moved where needed; students set about operating projectors, selecting books, building, painting, discussing. Sometimes a group would take their materials and move to the corridor or stairwell to avoid

intrusion. Another group might merge with pupils from another open classroom on the floor to carry out their plans. At other times, a resource teacher might arrive and unobtrusively take a group aside for some needed skill practice. Visitors were often seen in the room, although the children had learned to accept their presence with detachment. The teacher moved about the room, supervising, sharing ideas, offering suggestions, facilitating, demonstrating, observing, and chatting.

As each day wore on, a play script, a mural or a report might emerge. Learning games were everywhere. The bulletin boards, tables and ledges were covered with the products of individual effort, and a walk around the room yielded a study in textures and creativity. To some, the busy atmosphere might seem noisy and untidy, but to the children, this is what school should be for everyone, and they would be sorry to give it up. Later in the day some children showed signs of fatigue and their occupation was somewhat less gainful. Disruptive behavior could be noted as tired children lost their ability to sustain their effort. Fortunately, the problem these children created was limited, for the others were absorbed in other activities and did not notice.

Thus, the classroom was constantly changing, reflecting the needs of those who lived there, a place where the basic rule was to pursue your own intellectual inclinations in your own way, and where no one approach could be considered the only approach.

In contrast to the open classroom, the traditional classroom represented uniformity in the learning situation and supervision of all the children by the teacher. Here, all furniture was arranged so that all children could see the front of the room. All pupils were seated and the teacher directed their activities using her plans and aims for the day. The format for most of the lessons was essentially the same: the teacher would introduce and then proceed to explain a concept. The class would be obliged to listen carefully to the teacher and to raise their hands if they wished to ask a question or make a comment. Following this portion of the learning process, the teacher would provide some activity which constituted an application of the presentation in order to determine the actual extent of the pupils' comprehension. There was much variation in this aspect of the instruction. Children might answer questions from a text, do followup reading on their own, draw a picture, write a letter or composition, study a map, practice computation, and so on. Here, the teacher's time was often utilized in moving around the room, supervising the children's work and devoting extra time to those needing individual attention.

In the traditional classroom, the unruly pupil might disrupt the entire group because the entire group was generally participating in the same activity at the same time. In addition, the level of comprehension for the entire group was not uniform so that some might catch on faster than others making the allotment of time for the coverage of material a difficult problem. If the traditional teacher

was flexible in her approach, however, these problems could be overcome. For example, in the classrooms visited, children were assembled in small groups for skill training, and each group was geared to approximately the same level of ability. In addition, children who presented learning problems were often given special assignments and alternative activities to keep them from disrupting the class or wasting their time.

It was noted that, in spite of the difference in approach to learning which characterized the modified open and the traditional classrooms, there were areas in which the two structures overlapped, especially those areas where individualization of instruction occurred in the traditional classroom and where teacher evaluation of pupils occurred in the modified open classroom.

In the case of individualization of instruction, the relative amount of time available to the teacher under the traditional structure was considerably less; the activities, however, were alike: explaining, practicing with and encouraging the pupil, checking and rechecking for comprehension.

In the case of pupil evaluation by the teacher, generally concrete examples of pupil work were used. In the traditional structure teachers relied heavily on written test papers; in the modified open classroom, teachers used reports, projects, and other pupil contributions. In both instances, pupils were always given individual evaluations even when they worked as a group on a particular activity.

Results

A typical data analysis procedure in an evaluation study of this type is to compare the gain in achievement from pretest to posttest between the two treatment groups. Table I presents the sample sizes, measures of central tendency (range, pre-and posttest means and mean gain) and variability (standard deviations) of pretest and posttest results on the Metropolitan Achievement Test in Reading for pupils in the modified open classroom and for pupils in the traditional classroom structure. These data are expressed in terms of grade equivalent scores for the total test.

In order to determine whether there was a significant difference in achievement between the two groups a "t" test was performed on the mean scores.* The resulting t ratio of .101 proved to be non-significant at the minimally acceptable level of confidence. Thus, the data suggests that there was no significant difference in achievement in reading between the modified open classroom and traditional classroom groups.

This gain score design, however, has several limitations on the present situation. A review of Table I will indicate three areas which question the applicability of the gain score design to the present study. The first area concerns the sample sizes (N in Table I). As was described in the section on subjects, pre-and posttest data was available for 98 subjects who had been in the modified open class-

*by virtue of the large magnitude of difference in the variability of the two groups, a special case of the "t" test was used. This special procedure allows the between groups comparison even though the population variances were unequal.

room for the full school year. This sample size is quite adequate. On the other hand, complete pre-and posttest data was available for only 15 subjects who had been in the traditional classroom structure for the full school year. A sample size of 15 is considered small for a t statistic and raises questions as to the normality of the traditional classroom population. Normality is a basic assumption underlying the use of the t statistic.

A second area of concern with respect to the gain score design relates to the variability of the two populations. As can be seen in Table I, there is a range of 7.2 years (8.4-1.2) for the open classroom population compared to a quite restricted one year range for the traditional classroom population. These differences in range are reflected in the standard deviations (S.D.s) of the two groups. The S.D.s of the modified open classroom group are consistently larger than those of the traditional classroom group. Although these differences in variability were taken into account by the use of a modified "t" test for unequal population variances, such differences together with a large disparity in population sizes should be carefully considered when interpreting the data. The third and most important area of concern has to do with the comparability of the two groups. As can be seen in Table I, there is a large difference in pretest scores between the open classroom and traditional classroom groups. The open classroom or experimental group had an average pretest score of 3.57. Since the pretest was administered in the seventh month of

the second grade, these subjects averaged more than 7 months above the second grade norms. In contrast, the pretest mean of 2.05 for the traditional classroom group indicates that this group averaged more than 6 months below the second grade norm. Such differences suggest that the two populations were not comparable with respect to their reading ability. If the groups are not comparable with respect to initial reading scores, it cannot be assumed that their rates of growth will be comparable. Evaluation experts at the N.Y.S. Department of Education* reason that students who are below grade level in reading cannot be expected to progress at the same rate as their peers who are at or above grade level. A student who is one year below grade level cannot be expected to gain one year's achievement as a result of one year's instruction. Similarly, a child who is reading above grade level will probably gain more than one year's growth as a result of one year of instruction. This type of reasoning implies that an evaluation design which compares dissimilar groups will not be fruitful. In such cases, the Evaluation Division of the N.Y. State Education Department suggests that pupils be evaluated against their own prior achievement. This type of date analytic procedure is known as historical regression.

In the historical regression procedure, each subject acts as its own control. Given a standardized test, each subjects' actual or real posttest score as a result of some experimental treatment is

*Evaluator's Handbook, 1972

tested against an anticipated score which would have been attained had the pupil not been exposed to the treatment. This anticipated or hypothetical score, referred to as the predicted score, is determined, prior to treatment, by taking the pretest score, dividing it by a per month rate of growth (based on the number of months the subject has been in school, not counting Kindergarten) multiplying this per month rate of growth by the number of months of treatment, and then adding the resultant product to the pretest score. The difference between the real and the predicted score is then subjected to a correlated "t" test in order to determine whether or not the difference is statistically significant.

Table II presents the sample sizes, means and standard deviations for pretest, predicted posttest and actual posttest for the modified open and traditional classroom groups. It should be noted that the sample size of the modified open classroom group has been reduced from 98 as appeared in Table I to the 64 which appears in Table II. An examination of pretest scores for this group indicated that many subjects achieved a score in the upper range of the test. At this upper range the test is highly unreliable. For example, answering just one additional question correctly can raise the grade equivalent reading score anywhere from four to fifteen months. For this reason it was decided to limit the sample to those subjects who scored in the more accurate ranges of the test. A grade equivalent of 3.5 was chosen as the upper limit for inclusion in the sample. This restriction

caused the loss of 34 subjects from the original population.

As can be seen in Table II, the reduction of sample size resulted in substantially lower mean and standard deviation scores for the open classroom subjects. The modified open classroom group now has a pretest mean reading score very close to the norm of 2.7. The traditional classroom group, whose sample size remained the same, again averages more than six months below the grade level norm for the pretest. Similarly the actual posttest mean has dropped from 4.51 to 3.85 for the modified open classroom group.

In order to determine whether the two groups made significant gains in reading achievement in comparison to their own prior achievement, the predicted and actual posttest data for each group in Table II were subjected to a correlated "t" test. Table III lists the results of that analysis. The results of the historical regression analyses clearly indicate that neither the modified open classroom nor traditional classroom groups made reading achievement gains that were significantly different from gains they would be expected to make based on their prior reading growth.

It might be possible that reducing the sample size of the modified open classroom population had the effect of restricting the magnitude of difference between predicted and actual growth in reading, resulting in the finding of no significant difference. In order to determine whether this was the case, the achievement data for the total original population was subjected to the historical regression method. The

analysis yielded a t value of - .12. This statistic also lacks significance. More interesting, however, is the fact that it is negative. The negative sign indicates that, on a total group basis, actual achievement was lower than predicted achievement. It appears that the reasoning which led to the reduction of sample size was fitting and appropriate.

Summarizing the previous analyses it seems that both the modified open classroom and traditional classroom groups made gains in reading achievement. These gains, however, were not significantly different than their prior rate of reading growth. When examined in light of hypothesis 1, it appears that the group exposed to the modified open classroom method made reading achievement gains comparable to the magnitude of gains made in exposure to traditional classroom. Similarly the group exposed to traditional classroom structure made gains comparable to those made in the previous year when exposed to the same kind of traditional classroom structure on the whole, they did not do any better or worse than they did the previous year.

In addition to measuring gains in reading achievement, this study also sought to study the effects of exposure to the modified open classrooms with respect to attitudes toward school. It was hypothesized that subjects in the open classroom situation would have more positive attitudes toward school than children in the more restructive traditional classroom design.

In collecting the additional data, all pupils in each of the classroom designs were asked to respond to the questionnaire. There was a

total of 112 questionnaires collected in the open corridor classrooms and 47 questionnaires collected from pupils in the traditional classroom structure. However, several pieces of data had to be eliminated in order to maintain comparability with the data available on reading achievement. Questionnaire data had to fulfill two requirements in order to be included in the analysis:

1) The respondent had to participate in the treatment method for the full school year;
2) The respondent had to fully complete the additional questionnaire.

When the foregoing criteria were applied, the sample size for the open corridor group became 75 subjects. This reflects a loss of 23 subjects from the original sample of 98 for whom pre-and pottest reading achievement data were available. There was also a small loss of two subjects resulting in a sample size of 13 for the traditional classroom group. Table IV presents the means and standard deviations on the attitude toward school questionnaire for the two groups. A "t" test for independent samples was performed on the difference between means. The resulting t ratio of .24 failed to achieve even the minimal level of statistical significance. Thus it can be concluded that there is no difference in attitude toward school between the modified open corridor and traditional classroom groups.

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Table I Measures of Central Tendency and Variability in Grade Equivalent Scores for Modified Open and Traditional Classroom.

	N	Range	Pretest		Posttest		Mean Gain
			Mean	S.D.	Mean	S.D.	
Modified Open Classroom	98	1.2-8.4	3.57	1.38	4.51	1.37	.94
Traditional Classroom	15	1.5-2.5	2.05	.30	2.92	.75	.87

Table II Sample Sizes, Means and Standard Deviations of Pretest, Predicted Posttest and Actual Posttest Total Reading Scores Expressed in Grade Equivalents

	N	Pretest		Predicted Posttest		Actual Posttest	
		M	SD	M	SD	M	SD
Modified Open Classroom	64	2.80	.40	3.60	.68	3.85	.66
Traditional Classroom	15	2.05	.30	2.52	.42	2.92	.75

Table III Summary of Historical Regression Analysis on Real vs. Predicted Reading Scores

	Predicted Gain		Actual Gain		Difference (Actual-Predicted)	t value	Significance level
	M	S.D.	M	S.D.			
Modified Open Classroom	.80	.15	1.05	.61	.25	.45	not significant
Traditional Classroom	.47	.12	.87	.62	.40	.57	not significant

Table IV Means and Standard Deviations on Attitude Toward School Questionnaire

	N	Mean	S.D.
Modified Open Classroom	75	32.07	4.26
Traditional Classroom	13	31.77	3.03

COMMUNITY SCHOOL DISTRICT 24

67-54 80th STREET
MIDDLE VILLAGE, NEW YORK 11379
OFFICE OF FEDERAL & STATE PROGRAMS

IRVING BERCHUCK
Community Superintendent

MICHAELA J. VILHOTTI
Federal & State Coordinator
Telephone: 894-6047-8

STUDENT SELF-REPORT

Directions: Please read each of the following statements carefully. Then circle the word at the right of the statement which tells how true the statement is about you. Look at the sample statement. The student circled the word "sometimes" for the statement "I am a good student in school."

Sample Statement: I am a good student in school.	Always	Sometimes	Never
1. I feel happy and relaxed in school.....	Always	Sometimes	Never
2. I like to try new things in school.....	Always	Sometimes	Never
3. I get into fights with my classmates.....	Always	Sometimes	Never
4. I feel confident about my abilities.....	Always	Sometimes	Never
5. I can work by myself when I have to.....	Always	Sometimes	Never
6. I take pride in my work.....	Always	Sometimes	Never
7. I am careless about my clothing and appearance....	Always	Sometimes	Never
8. I act friendly in school.....	Always	Sometimes	Never
9. I get mad when things go wrong in school.....	Always	Sometimes	Never
10. I am polite to my teachers and classmates.....	Always	Sometimes	Never
11. I try to cooperate with teachers and classmates...	Always	Sometimes	Never
12. I appreciate it when my teacher corrects me.....	Always	Sometimes	Never
13. I make trouble in school.....	Always	Sometimes	Never
14. I keep my mind on my work in the classroom.....	Always	Sometimes	Never
15. I get satisfaction from my work.....	Always	Sometimes	Never
16. I like to take part in class activities.....	Always	Sometimes	Never
17. I get mad when I am told how to behave.....	Always	Sometimes	Never
18. I come to school unless I am sick.....	Always	Sometimes	Never
19. I pay attention in the classroom.....	Always	Sometimes	Never
20. I complete my classwork and homework assignments..	Always	Sometimes	Never
21. I feel happy and relaxed in school.....	Always	Sometimes	Never